

Stability of Out-Of-Plane Equilibrium Points in the Elliptic Restricted Three-Body Problem with Oblateness up to Zonal Harmonic J_4 of Both Primaries

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Abstract : In this paper, we examined the location and stability of Out-Of-Plane Equilibrium points in the elliptic restricted three-body problem of an infinitesimal body when both primaries are taken as oblate spheroids with oblateness up to zonal harmonic J_4 . The positions of the Equilibrium points $L_{6,7}$ and their stability depend on the oblateness of the primaries and the eccentricity of their orbits. We explored the problem numerically to show the effects of parameters involved in the position and stability of the Out-Of-Plane Equilibrium points for the systems: HD188753 and Gliese 667. It is found that their positions are affected by the oblateness of the primaries, eccentricity and the semi-major axis of the orbits, but its stability behavior remains unchanged and is unstable.

Keywords : out-of-plane, equilibrium points, stability, elliptic restricted three-body problem, oblateness, zonal harmonic

Conference Title : ICAPM 2018 : International Conference on Applied Physics and Mathematics

Conference Location : Zurich, Switzerland

Conference Dates : July 30-31, 2018